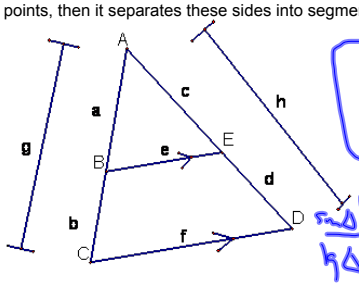
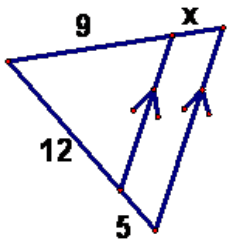
6.4 Parallel lines and proportional parts

Theorem 6.4-Triangle Proportionality Theorem-If a line is parallel to one side of a triangle and intersects the other two sides in two distinct points, then it separates these sides into segments of proportional lengths.



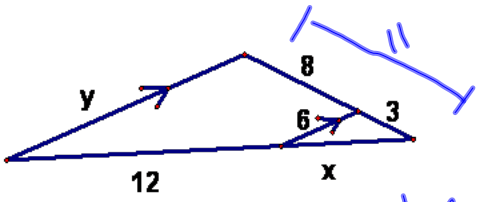
$\frac{a}{b} = \frac{c}{d}$

and $\frac{e}{f} = \frac{g}{g} = \frac{c}{h}$



$\frac{9}{x} = \frac{12}{5}$

$x = 3.75$



Use whole Δ's for ∥ segments

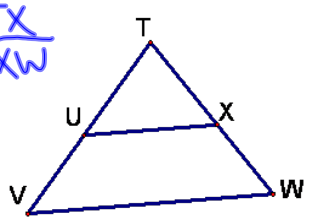
$\frac{x}{12} = \frac{3}{8}$ $x = 4.5$

$\frac{6}{y} = \frac{3}{11}$ $y = 22$

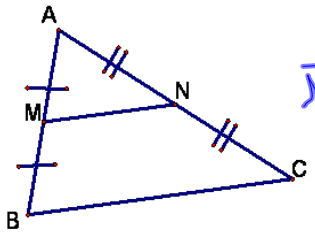
Theorem 6.5-Converse of the triangle proportionality Theorem-
If a line intersects two sides of a triangle and separates these sides into segments of proportional length then the line is parallel to the third side.

If $\frac{TU}{UV} = \frac{TX}{XW}$

then $\overline{UX} \parallel \overline{VW}$

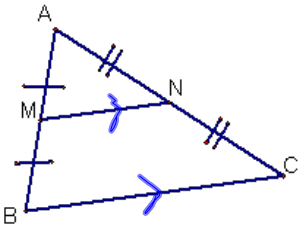


Midsegment-of a triangle is a segment whose endpoints are the midpoints of two sides of a triangle.



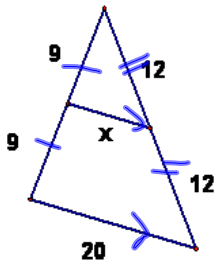
$\overline{MN}$ is a midsegment

Theorem 6.6-Triangle Midsegment theorem-A midsegment of a triangle is parallel to one side of the triangle, and its length is ½ the length of that side.



$\overline{MN} \parallel \overline{BC}$

$MN = \frac{1}{2} BC$



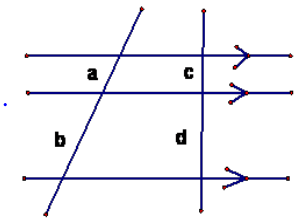
$\frac{x}{20} = \frac{9}{18}$

$x = \frac{1}{2} 20$

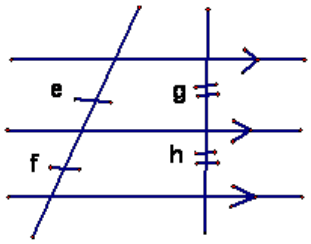
$x = 10$

Corollary 6.1-If three or more parallel lines intersect two transversals, then they cut the transversals proportionally

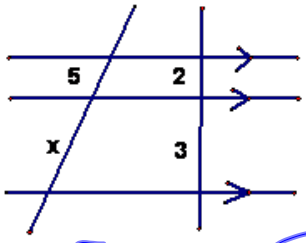
Corollary 6.2-If three or more parallel lines cut off congruent segments on one transversal, then they cut off congruent segments on every transversal.



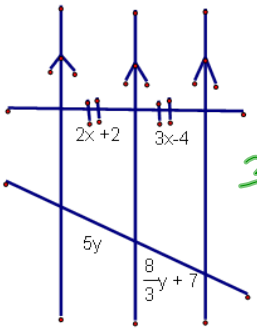
$\frac{a}{b} = \frac{c}{d}$



If $e = f$
then $g = h$



$\frac{5}{x} = \frac{2}{3}$ $x = 7.5$



$2x+2 = 3x-4$

$6 = x$

$3\left(5y = \frac{8}{3}y + 7\right)$

$15y = 8y + 21$

$7y = 21$

$y = 3$

HW
p312-313 #s 14-18, 20, 21, 33, 34

p320-321 #s 10, 11, 14, 22-24